

United States

ENVIRONMENTAL PROTECTION AGENCY

State Implementation Plans (SIPs) Summary

Section 110

Plan Name: Knoxville TN 1997 8 hour Ozone Limited Maintenance Plan

State(s): TN

Submitted By: James P Johnston, TN

Submitted: January 23, 2020, 10:17 AM (EST)

Plan Submission Information

Enter a brief title of the plan or plan elements you are submitting. Knoxville TN 1997 8 hour Ozone Limited Maintenance Plan

What type of material are you submitting?

Redesignation Request(s)/Maintenance Plan(s)

Select the standard(s) that are addressed by the Redesignation Request(s)/Maintenance Plan(s) included in this submission.

- 8-Hour Ozone (1997 Standard)
 - Knoxville Area

Provide the date adopted for the Redesignation Request/Maintenance Plan.: 01/08/2020

Provide the effective date for the Redesignation Request/Maintenance Plan.: 01/08/2020

Are you submitting any of the above Redesignation Requests(s)/Maintenance Plan(s) for parallel processing? No

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Completeness Certification

Verify that all applicable completeness requirements are included in this submittal. I have included all of the applicable completeness requirements in my submittal.

Does this SIP submission include additional documentation (e.g., large modeling files) that is not submitted through this electronic system? No

Uploaded Documentation

FILE NAME	FILE TYPE	FILE DESCRIPTION
APC Final Knoxville 8 Hour Ozone Orphan Area Limited Maintenance Plan 011620.pdf	pdf	
APC MWO Transmittal Letter To Admin Walker RE Knoxville LMP 011720.pdf	pdf	



STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Division of Air Pollution Control
15th Floor, William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, Nashville, TN 37243

January 17, 2020

Mary S. Walker
Regional Administrator
US EPA, Region IV
Atlanta Federal Center, 12th Floor
61 Forsyth Street, SW
Atlanta, GA 30303-3104

RE: Submission of the 1997 8-Hour Ozone Limited Maintenance Plan for the Knoxville, Tennessee 1997 8-Hour Ozone "Orphan" Maintenance Area

Dear Regional Administrator Walker,

I am pleased to submit a 1997 8-Hour Ozone Limited Maintenance Plan for the Knoxville, Tennessee, 1997 8-Hour Ozone "Orphan" Maintenance Area. As you'll recall, on February 16, 2018, the D.C. Circuit Court issued a decision in *South Coast Air Quality Management District v. EPA*. The Court held that "orphan maintenance areas" are required to submit the "second 10-year" maintenance plans under CAA section 175A(b). These areas, therefore, must submit a second maintenance plan to ensure maintenance through the full 20-year period following the effective date of redesignation.

This document provides Tennessee's maintenance plan for the remainder of the 20-year maintenance period for the 1997-8 hour ozone NAAQS. This document is being respectfully submitted to the EPA to meet Tennessee's CAA section 175A(b) obligations for this area.

If you have any questions or require additional information on this, please feel free to contact me at (615) 532-0554.

Sincerely,


Michelle W. Owenby
Director

Attachments (1)

Ecc: Dr. Kenneth L. Mitchell, EPA Region IV
Lynorae Benjamin, EPA Region IV
Andres Febres, EPA Region IV

***1997 8-Hour Ozone
Limited Maintenance Plan
for the
Knoxville, Tennessee 1997 8-Hour Ozone “Orphan”
Maintenance Area***

November, 2019

Prepared by:
Tennessee Department of Environment and Conservation
Air Pollution Control Division



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Acronyms and Abbreviations

APCD	Air Pollution Control Division
BMP	Beneficiary Mitigation Plan
CAA	Clean Air Act
CAIR	Clean Air Interstate Rule
CAMX	Comprehensive Air Quality Model with Extensions (model)
CAP	Criteria Air Pollutant
CMAQ	Community Multiscale Air Quality
CMV	Commercial Marine Vessel
CSAPR	Cross-State Air Pollution Rule
DOJ	Department of Justice
DV	Design Value
EGU	Electric Generating Unit
EMT	Environmental Mitigation Trust
EPA	Environmental Protection Agency
FIP	Federal Implementation Plan
HAP	Hazardous Air Pollutant
HC	Hydrocarbon
LMP	Limited Maintenance Plan
MOVES	Motor Vehicle Emissions Simulator (model)
NAAQS	National Ambient Air Quality Standard
NATA	National Air Toxics Assessment
NEI	National Emissions Inventory
NO _x	Oxides of Nitrogen
ppb	parts per billion
ppm	parts per million
RACT	Reasonably Available Control Technology
SIP	State Implementation Plan
SMOKE	Sparse Matrix Operator Kernel Emissions
TDEC	Tennessee Department of Environment and Conservation
TVA	Tennessee Valley Authority
VOC	Volatile Organic Compound
VW	Volkswagen

Introduction

The Clean Air Act (CAA) requires areas that were formerly not meeting certain National Ambient Air Quality Standards (NAAQS), commonly referred to as nonattainment areas, develop maintenance plans to show continued maintenance of, and to document a plan to address future violations of, the NAAQS. These maintenance plans are divided into two ten-year periods, with a new plan developed for each. The Knoxville Area is nearing the end of its first 10-year maintenance plan for the 1997-8 hour ozone NAAQS. Thus, Tennessee is due to submit to the Environmental Protection Agency (EPA) a second 10-year maintenance plan. One of the options EPA provided areas that qualify is a limited maintenance plan (LMP). This document is Tennessee's LMP for the Knoxville 1997 8-hour ozone "Orphan" Maintenance Area. "Orphan" maintenance areas were defined in a court¹ decision as those areas that were maintenance areas for the 1997 8-hour ozone NAAQS at the time of its revocation and were designated attainment for the 2008 8-hour ozone NAAQS in EPA's original designation for this NAAQS. This plan sets forth air quality and emissions data that assures the area will continue to maintain the 1997 8-hour ozone NAAQS. Further, in the unlikely possibility the area does have a violating design value (DV), this document describes a plan to promptly address the NAAQS violation.

This document provides Tennessee's maintenance plan for the remainder of the 20-year maintenance period for the 1997-8 hour ozone NAAQS. This document is being respectfully submitted to the EPA to meet Tennessee's CAA section 175A(b) obligations for this area.

Background

The EPA revoked the 1997 8-hour ozone NAAQS effective April 5, 2015. EPA's 2008 8-hour ozone "Implementation Plan Requirements"² rule provided that states were no longer responsible, under certain conditions, for developing and submitting maintenance plans for former 1997 ozone NAAQS nonattainment areas. Certain aspects of EPA's Implementation Plan rule were challenged in court¹. One of the items challenged was the Agency's rule that excused "orphan maintenance areas," i.e., areas that had been redesignated to attainment for the 1997 ozone NAAQS and were initially designated attainment for the 2008 ozone NAAQS, from submitting a second maintenance plan for the 1997 ozone NAAQS.

¹ United States Court of Appeals for the District of Columbia Circuit. *South Coast Air Quality Management District v. EPA*. Available at: [https://www.cadc.uscourts.gov/internet/opinions.nsf/217B6778AE3EC89C8525823600532AE0/\\$file/15-1115-1718293.pdf](https://www.cadc.uscourts.gov/internet/opinions.nsf/217B6778AE3EC89C8525823600532AE0/$file/15-1115-1718293.pdf).

² Federal Register. Vol. 80, No. 44, p. 12264. *Implementation of the 2008 National Ambient Air Quality Standards for Ozone: State Implementation Plan Requirements*. Available at: <https://www.govinfo.gov/content/pkg/FR-2015-03-06/pdf/2015-04012.pdf>.

On February 16, 2018, the D.C. Circuit Court issued a decision in *South Coast Air Quality Management District v. EPA (South Coast II)* that, among other things, granted the petitioner's argument on this point. The Court held that "orphan maintenance areas" are required to submit the "second 10-year" maintenance plans under CAA section 175A(b). These areas, therefore, must submit a second maintenance plan to ensure maintenance through the full 20-year period following the effective date of redesignation.

To assist areas that were nonattainment or maintenance for the 1997 8-hour ozone NAAQS develop their second 10-year maintenance plans, EPA provided a resource document that outlines LMPs as an option those areas may choose to meet CAA section 175A requirements³. LMP requirements are described in the next section.

The EPA approved a redesignation request and maintenance plan for the 1997 8-hour ozone NAAQS for the Knoxville Area effective March 8, 2011⁴. This maintenance plan satisfied the CAA's section 175A(a) requirement for the submission of the first 10-year maintenance plan. For redesignation, the petition must satisfy the requirements of CAA sections 107(d)(3)(E). This second 10-year maintenance plan, in this case an LMP, builds upon the foundation established by the first maintenance plan, previously approved by EPA through the Federal Register⁴.

Limited Maintenance Plan Requirements

CAA section 175A(a) requires that areas seeking redesignation to attainment "submit a revision of the applicable State Implementation Plan to provide for the maintenance of the national primary ambient air quality standard for such air pollutant in the area concerned for at least 10 years after the redesignation". Section 175A(b) requires the state to submit a second plan for maintaining the NAAQS for another 10 years, for a total of 20 years. Generally, maintenance is demonstrated for the maintenance period by projecting emissions inventories throughout the maintenance period; demonstrating that emissions are not projected to increase beyond the level at which the area achieved attainment with the NAAQS. Alternatively, photochemical modeling can be conducted to project air quality at the end of the maintenance period; demonstrating air quality continues to meet the NAAQS.

EPA published several guidance documents describing "limited maintenance plans". EPA provides this option to some areas if they meet specific conditions. The key criteria outlined in these documents are that the current air quality levels for ambient monitoring sites in the area are substantially below the level of the standard. EPA provided guidance that "substantially" is

³ USEPA. *Resource Document for 1997 Ozone NAAQS Areas: Supporting Information for States Developing Maintenance Plans*. November 20, 2018. Available at: https://www.epa.gov/sites/production/files/2018-11/documents/ozone_1997_naaqs_lmp_resource_document_nov_20_2018.pdf.

⁴ Federal Register. March 8, 2011.

interpreted as below 85% of the level of the standard³, and that air quality levels have not been highly variable during preceding years.

In comparison to developing a conventional 175A(b) maintenance plan, development of an approvable LMP is generally less resource intensive. An LMP submission may primarily rely on air quality data to demonstrate that the area is not expected to experience a future NAAQS violation, and it does not need to include projected future year emissions inventories or air quality modeling to make that demonstration. EPA's resource document³ describes what states need to submit to satisfy the CAA's section 175A requirement to "provide for maintenance of the NAAQS" with a LMP according to the following criteria:

1. "Current air quality levels significantly below the level of the standard: As indicated in prior memoranda, the EPA believes that an air quality design value below 85% of the level of the standard (i.e., a design value of 0.071 ppm as compared to a level of 0.084 ppm, which is considered to be in compliance with the 1997 ozone standard to three digits) could be considered significantly below the standard and may be a good indicator that air quality is not likely to deteriorate to a level that would violate the NAAQS over the next 10 year period.", and,
2. "Stable or improving air quality trend: Several kinds of analyses can be performed to assess whether an area has had relatively stable or consistently improving air quality levels over the long term such that the probability of the area violating the standard in the future would be considered low. One basic approach would be to take the most recent design value for the area and add the maximum design value increase (over one or more consecutive years) that has been observed in the area over the past several years. A sum that does not exceed the level of the 1997 ozone standard may be a good indicator of expected continued attainment."

Ozone

Tropospheric ozone is a secondary pollutant that is formed in the ambient air by the photochemical reaction of nitrogen oxides (NO_x) and reactive volatile organic compounds (VOC). Ozone pollution is associated with a number of health and environmental impacts, including respiratory impairment and damage to plants (including crops). High ozone concentrations tend to occur in eastern Tennessee during the summer months under hot, stagnant conditions. EPA mandates seasonal monitoring of ambient ozone concentrations in Tennessee from March 1 through October 31⁵. Because ozone is formed in the ambient air, control of ozone focuses upon reduction of precursor emissions of NO_x and VOC.

⁵ 40 CFR 58 Appendix D.

NO_x is formed from the high-temperature reaction of nitrogen and oxygen during combustion processes such as those from power plants that use coal, oil or natural gas as fuel, industrial fuel-burning sources, and motor vehicles. Sources of VOC include many industrial solvents, paints and coatings, as well as the hydrocarbons (HC) that are emitted by motor vehicles as evaporative losses from gasoline, and tailpipe emissions of unburned hydrocarbons. Past efforts at the control of ground-level ozone have focused on both reductions of VOC and NO_x emissions at the local level. Research has shown, however, that the Southeast does not see a significant impact on ground-level ozone from the reduction of VOC emissions due to the high levels of VOC emissions from biogenic (naturally occurring vegetation, soils, etc.) sources. This increases the importance of the control of NO_x emissions, the “limiting” precursor pollutant, at both the local and regional levels.

Between 2001 and 2003, ozone air quality monitoring data at several sites within the Knoxville region indicated that the highest 8-hour average ozone concentrations exceeded the 80 parts per billion (due to truncation, effectively 84 parts per billion (ppb), or 0.084 parts per million (ppm)) NAAQS. EPA designated the area as nonattainment for the 1997 8-hour ozone NAAQS, effective June 15, 2004⁶. EPA designated the Knoxville Nonattainment Area to include Anderson, Blount, Jefferson, Knox, Loudon and Sevier Counties in their entirety, as well as the portion of Cocke County that falls within the boundaries of the Great Smoky Mountains National Park. The area was designated as a Basic nonattainment area, pursuant to Subpart 1 of the 1990 CAA Amendments. The Subpart 1 designation was vacated by the U. S. Circuit Court of Appeals for the District of Columbia in 2006⁷, and EPA published a proposed rule on January 16, 2009, that designated the area as a Subpart 2 Moderate nonattainment area for ozone⁸. Air quality monitoring data for 2007 through 2009 indicated declining ozone concentrations in the Knoxville area, and the design value at the controlling monitors fell below the 1997 8-hour ozone NAAQS. In July of 2010, TDEC petitioned EPA for redesignation of the Knoxville Area to maintenance based on the 2007-2009 ozone monitoring data. Effective March 8, 2011, EPA redesignated the Knoxville Area to attainment with maintenance for the 1997 8-hour ozone NAAQS⁹.

EPA strengthened the ozone standard in 2008 based on an updated review of scientific and medical data to ensure that air quality standards are set at an appropriate level to protect the environment and human health. This more stringent standard is known as the “2008 8-hour ozone Standard” and it was set at 75 ppb (0.075 ppm). Nonattainment designations for this standard were published in the May 21, 2012, *Federal Register*, with an effective date of July 20, 2012 and included in the Knoxville Area the counties of Blount and Knox, as well as a portion of Anderson County surrounding the TVA Bull Run Fossil Plant. In November of 2014, TDEC requested EPA redesignate this area to attainment, based on attaining ozone air quality data. The EPA approved a

⁶ Federal Register. April 30, 2004.

⁷ United States Court of Appeals, District of Columbia Circuit. *South Coast Air Quality Management District vs. EPA*. December 22, 2006.

⁸ Federal Register. January 16, 2009, pp 2936 – 2945.

⁹ Federal Register. March 8, 2011.

redesignation of the area to attainment with a maintenance plan effective on August 12, 2015¹⁰. Figure 1 illustrates the former nonattainment areas, now maintenance areas, for the 1997 and 2008 8-hour ozone NAAQS. Note, the area shaded in orange was also part of the 1997 8-hour ozone nonattainment area.

At the writing of this document, all of the Knoxville area is in attainment for each of the various ozone NAAQS, including the most recent, and most restrictive NAAQS: the 2015 8-hour ozone NAAQS set at a level of 70 ppb (0.070 ppm). Table 1 contains historical 3-year 8-hour ozone design values from 2001-2003 to 2016-2018. These values are in parts per billion (ppb), sometimes easier to reference than parts per million (ppm). To change from ppm to ppb, the decimal point is moved three places to the right (e.g. 0.070 ppm is 70 ppb). The DV is the metric EPA uses to determine whether a monitor's measured ozone concentration meet or exceed the level of the ozone NAAQS. The ozone DV is a three-year average of the fourth highest ozone reading at an ozone monitor. The ozone monitor in an area with the highest ozone readings, termed the "ruling" monitor, is typically used to determine an area's attainment status.

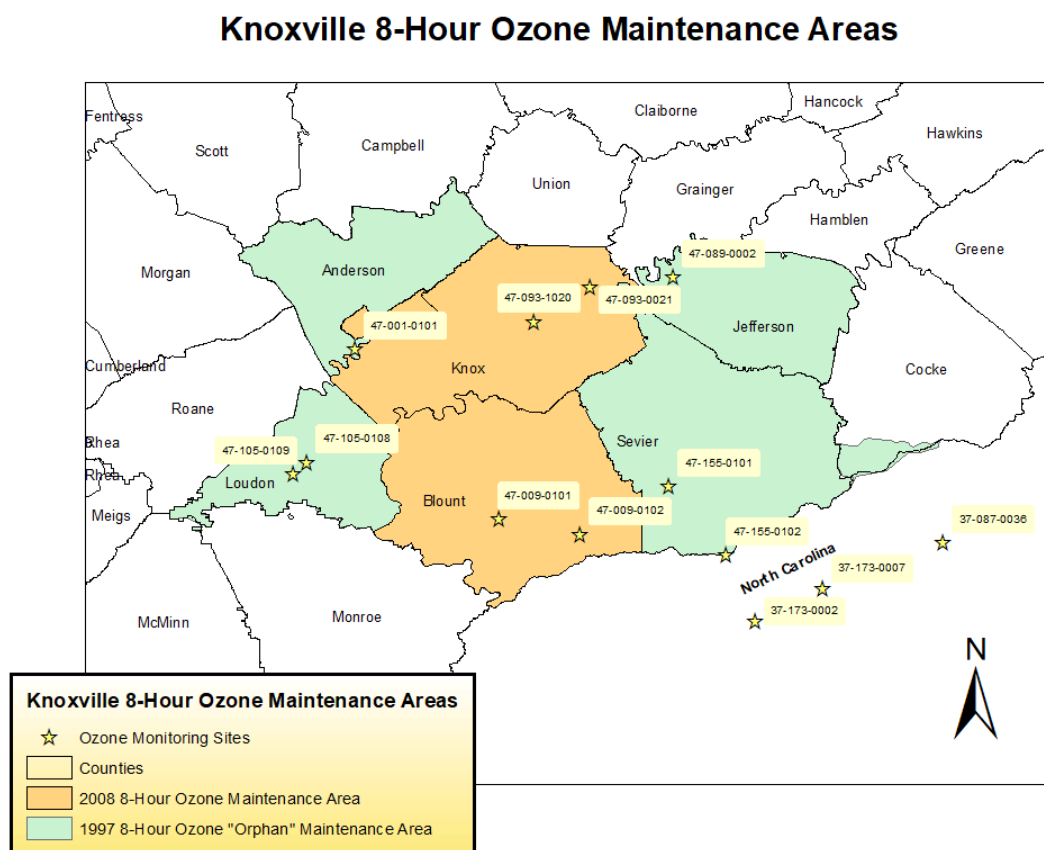


Figure 1. Knoxville 8-Hour Ozone Maintenance Areas.

¹⁰ Federal Register. July 13, 2015.

Table 1 includes the historical DV values as reported on EPA's Air Trends Website¹¹ and includes ozone monitors in Knoxville and the surrounding area. Table 1 indicates that all of the ozone monitors in the Knoxville area attained the 1997 8-hour ozone NAAQS (0.08 ppm, which was effectively 0.084 ppm, or 84 ppb) beginning with the 2007-2009 DV. Subsequent to that, all of the Knoxville area ozone monitors attained the 2008 8-hour ozone NAAQS (75 ppb) beginning with the 2011-2013 DV. Continuing the downward trend in ozone, all of the Knoxville ozone monitors met the 2015 ozone NAAQS (70 ppb) beginning with the 2013-2015 DV. Figure 2 graphs the ozone DVs from Table 1 to help visually illustrate the downward trend in ozone readings in the Knoxville area. As can be seen from Figure 2, the trend in ozone readings has generally been consistently downward or flattening in recent years.

As Table 1 and Figure 2 indicate, the history of ozone DVs is generally downward. The largest increase in recent history occurred between the 2013-2015 and 2014-2016 DVs. Here, a three ppb increase occurred at a number of ozone monitors throughout the region. Then again, the following year, the 2015-2017 DV increased at the Spring Hill Elementary School ozone monitor (AQ5 Site ID 47-093-1020) by another ppb. Since then, the ozone DV at this monitoring site has stabilized at 67 ppb (0.067 ppm). Yet, given this 'worst-case' scenario of a four ppb increase in the DV over a two year period, this increase, should it occur again, would potentially increase the highest DV to 71 ppb (0.071 ppm). This 'worst-case' DV would still be well below the 1997 8-hour ozone NAAQS of 84 ppb, and would still only be 85% of the 1997 8-hour ozone NAAQS.

EPA's website contains projected 2023 ozone DVs for a number of the ozone monitors in the Knoxville region (based on projected emissions inventory data and air quality modeling performed by EPA in support of interstate ozone transport actions by the EPA and/or states for the 2008 and/or 2015 ozone NAAQS)¹². EPA made projections of ozone air quality based on historical emissions and air quality, as well as projected future emissions. These projected DVs provide additional support to show that the area is expected to continue to maintain the ozone standard during the maintenance period. The projected 2023 ozone design values for selected ozone monitors are shown in the last column of Table 1.

Limited Maintenance Plan

Tennessee is petitioning EPA to approve an LMP for the Knoxville 1997 8-hour ozone "Orphan" area. This area is the 1997 8-hour ozone maintenance area, minus the subsequent 2008 8-hour ozone maintenance area (Knox, Blount and part of Anderson Counties). The 1997 8-hour ozone "Orphan" area is illustrated in Figure 1; the area shaded in light green. The area shaded orange in Figure 1 illustrates the area that is currently maintenance for the 2008 8-hour ozone NAAQS, is

¹¹ <https://www.epa.gov/air-trends/air-quality-design-values>.

¹² https://www.epa.gov/sites/production/files/2018-06/documents/aq_modelingtsd_updated_2023_modeling_o3_dvs.pdf.

Table 1. Knoxville Area 3-Year Ozone Design Value History and Projected 2023 DV at Selected Ozone Monitors.

AQS Site ID	Local Site Name	State	County	2001-2003 Design Value	2002-2004 Design Value	2003-2005 Design Value	2004-2006 Design Value	2005-2007 Design Value	2006-2008 Design Value	2007-2009 Design Value	2008-2010 Design Value	2009-2011 Design Value	2010-2012 Design Value	2011-2013 Design Value	2012-2014 Design Value	2013-2015 Design Value	2014-2016 Design Value	2015-2017 Design Value	2016-2018 Design Value	Projected 2023 Design Value
----- parts per billion (ppb) Ozone -----																				
47-001-0101	Freel's Bend O3 and SO2 monitoring	TN	Anderson	87	82	76	76	80	77	72	70	70	73	69		61	63	64	64	54.3
47-009-0101	Great Smoky Mountains National Park, Look Rock	TN	Blount	92	91	86	84	86	85	79	77	77	79	74	67	65	67	67	67	59
47-009-0102	Great Smoky Mountains National Park, Cade's Cove	TN	Blount	76	73		67	70	72	69	69	68	68	63	60	59	60	61	62	50.8
47-089-0002	New Market ozone monitor	TN	Jefferson	91	87	82	81	84	81	76	74	73	78	73	71	67	68	67	66	56.9
47-093-0021	East Knox Elementary School	TN	Knox	88	84	79	76	81	81	77	71	69	71	67	63	61	64	64	65	52.6
47-093-1020	Spring Hill Elementary School	TN	Knox	92	88	84	83	88	88	82	76	71	74	70	67	63	66	67	67	54.2
47-099-0002	Lawrence Co ozone monitor	TN	Lawrence	77	76															
47-105-0108	Loudon Pope site	TN	Loudon														69			
47-105-0109	Loudon Middle School ozone monitor	TN	Loudon				81	85	82	77	73	72	75	70					67*	55.9
47-155-0101	Great Smoky Mountains National Park, Cove Mountain	TN	Sevier	92	86	78	77	82	82	79	76	75	76	72	68	67	67	66	67	57.6
47-155-0102	Great Smoky Mountains National Park, Clingman's Dome	TN	Sevier	92	87															
37-087-0036	Purchase Knob	NC	Haywood	85	82	78	76	78	77	74	72	67	69	67	66	65	65	65	64	53.8
37-173-0002	Bryson City	NC	Swain	73	71	68	65	66	65	64	64	62	62	58	57	57	60	60	60	48.7
37-173-0007	Un-Named	NC	Swain												58	59	61	58	58	

*Value derived from data for sites 47-105-0108 and 47-105-0109 for the 2016-2018 design value.

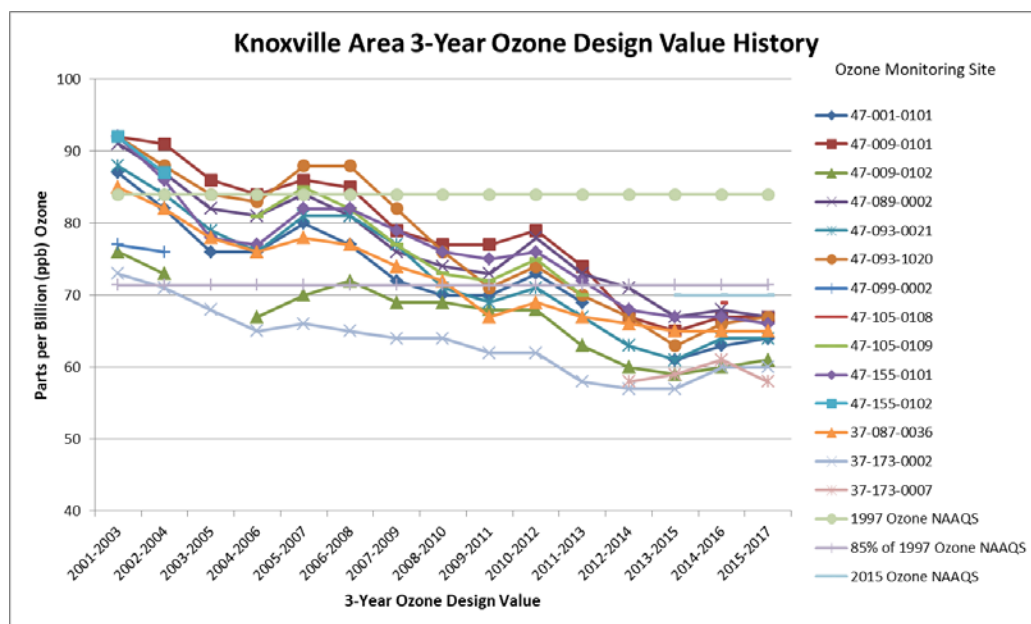


Figure 2. Knoxville Area 3-Year Ozone Design Value History.

subject to that maintenance plan, and is not a portion of the Knoxville 1997 8-hour ozone “Orphan” area.

Ozone Air Quality in the Knoxville Area

EPA’s recently published resource document³ references guidance on LMP requirements. The key requirement is monitored air quality data that shows, in this case, ozone readings below 85% of the 1997 8-hour ozone NAAQS. That translates to a DV of 71 ppb (0.071 ppm) ozone. Table 1 includes the most recent certified DVs, and illustrates that the Knoxville Area has ozone DVs below this level since 2015 (as illustrated by the 2013-2015 DVs).

Emissions Inventory

In an LMP, the maintenance demonstration requirement is considered satisfied if the monitoring data shows the area is meeting the air quality criteria for limited maintenance areas (i.e., 85% or lower of the 1997 8-hour ozone NAAQS). Due to the low ozone air quality readings meeting the 85% threshold, LMPs are not required to project emissions over the maintenance period.

Since the ozone redesignation for the Knoxville 1997 8-hour ozone area was effective on March 8, 2011, the 20-year maintenance period ends March 8, 2031. This document assures maintenance of the 1997 8-hour ozone NAAQS throughout that time.

As stated earlier, a projected emissions inventory is not required, but EPA’s Resource Document³ provides links to already prepared emissions inventories to illustrate emissions trends in support of LMPs¹³. Included below are two summary tables generated from the data EPA made available from the 2014 National Emissions Inventory (NEI) with projections out to 2028. The 2014 emissions inventory information is from the EPA 2014 version 7.0 modeling platform.

EPA developed an air quality modeling platform for air toxics and criteria air pollutants that represents the year 2014 based on the 2014 NEI. The air quality modeling platform consists of all the emissions inventories and ancillary data files used for emissions modeling, as well as the meteorological, initial condition, and boundary condition files needed to run the CMAQ (Community Multiscale Air Quality) air quality model. This 2014 modeling platform includes all criteria air pollutants (CAPs) and precursors and two groups of hazardous air pollutants (HAPs). The 2014 platform was used to support the 2014 National Air Toxics Assessment (NATA), the focus of which is multipollutant modeling of HAPs and CAPs using the CMAQ model version 5.2. The CMAQ modeling domain includes the lower 48 states and parts of Canada and Mexico. The 2014 NATA also utilizes the American Meteorological Society/Environmental Protection Agency Regulatory

¹³ https://www.epa.gov/sites/production/files/2018-11/ozone_1997_naags_air_qual_monitoring_and_modeling_data_nov_19_2018_1.xlsx.

Model (AERMOD), which is an air dispersion modeling system, for all NEI HAPs (about 130 more than are covered by CMAQ) across all 50 states, Puerto Rico and the Virgin Islands. The emissions data in the 2014v7.0 platform are primarily based on the 2014NElv1 for point sources, nonpoint sources, commercial marine vessels (CMV), onroad and nonroad mobile sources, and fires.

The primary emissions modeling tool used to create the air quality model-ready emissions was the Sparse Matrix Operator Kernel Emissions (SMOKE) modeling system¹⁴. Primarily SMOKE version 4.0 was used, although to enable some speciation enhancements, a beta version of SMOKE 4.5 was used for some modeling sectors.

Onroad and nonroad mobile source emissions in the 2014NElv1 were developed using the Motor Vehicle Emission Simulator (MOVES) model. MOVES2014a was used with inputs, where provided, by state and local air agencies, in combination with EPA-generated default data. Detailed information on the development of the EPA 2014 version 7.0 modeling platform is available at EPA's Air Emissions Modeling Website¹⁵.

The 2028 emissions inventory is projected from EPA's 2011 version 6.3 modeling platform. EPA developed an air quality modeling platform for 2011 based on the 2011 NEI, version 2 (2011NElv2). The air quality modeling platform consists of all the emissions inventories and ancillary data files used for emissions modeling, as well as the meteorological, initial condition, and boundary condition files needed to run the air quality model.

Many emissions inventory components of this air quality modeling platform are based on the 2011NElv2, although there are some differences between the platform inventories and the 2011NElv2 emissions as a result of addressing public comments and the incorporation of newly available data and improved methods. This 2011 modeling platform includes all CAPs and precursors and a number of HAPs.

The 2011v6.3 platform was used to support the Final Cross-state Air Pollution Update Rule, the focus of which is ozone transport modeling for the 2008 ozone NAAQS. The air quality model used for this rule is the Comprehensive Air Quality Model with Extensions (CAMX) model (more information on this model is available at: <http://www.camx.com/>), version 6.20. Emissions are first processed into a format compatible with the CMAQ model (more information on this model is available at: <https://www.epa.gov/cmaq/cmaq-models-0>), version 5.0.2 and those emissions are converted into a CAMX-ready format.

The emissions data in the 2011v6.3 platform are primarily based on the 2011NElv2 for point sources, nonpoint sources, CMV, nonroad mobile sources and fires. The onroad mobile source emissions are similar to those in the 2011NElv2, but were generated using the recently released

¹⁴ <http://www.smoke-model.org/>.

¹⁵ <https://www.epa.gov/air-emissions-modeling/2014-2016-version-7-air-emissions-modeling-platforms>.

2014a version of the MOVES model. The primary emissions modeling tool used to create the air quality model-ready emissions was the SMOKE modeling system. The inventory documentation for this platform can be found on EPA's Air Emissions Modeling Website¹⁶.

Once the 2011 base platform was developed, those emissions had to be projected to the out-year of 2028. The original purpose for the development of the 2028 emissions projection was to perform analyses related to regional haze for the base year of 2011 and future year of 2028. The EPA adopted 2028 as the analytic year for this effort because the regional haze rule requires a SIP that evaluates reasonable progress for implementation periods in 10-year increments.

The 2028 "base case" scenario represents the best estimate for 2028 that incorporates estimates of the impact of current "on-the-books" regulations. The emissions data in this platform are primarily based on the 2011NElv2 for point sources, nonpoint sources, CMV, nonroad mobile sources and fires. The onroad mobile source emissions are similar to those in the 2011NElv2, but were generated using the recently released 2014a version of the MOVES model. Except for California and Texas, all onroad emissions are generated using the SMOKE-MOVES emissions modeling framework that leverages MOVES-generated outputs. The emission inventories for the future year 2028 were developed using projection methods that are specific to the type of emission source. Future emissions are projected from the 2011 base case either by running models to estimate future year emissions from specific types of emission sources (e.g., EGUs, and onroad and nonroad mobile sources), or for other types of sources by adjusting the base year emissions according to the best estimate of changes expected to occur in the intervening years (e.g., expected growth or reductions in non-EGU point and nonpoint sources). For some sectors, the same emissions are used in the base and future years, such as biogenic, fire, and stationary nonpoint source emissions in Canada. For the remaining sectors, rules and specific legal obligations that go into effect in the intervening years, along with changes in activity for the sector, are considered when making projections.

For non-EGU point and nonpoint sources, projections of 2028 emissions were developed by starting with the 2011 emissions inventories and applying adjustments that represent the impact of national, state, and local rules coming into effect in the intervening years, along with the impacts of planned shutdowns, the construction of new plants, specific information provided by states, and specific legal obligations resolving alleged environmental violations, such as consent decrees. Changes in activity are considered for sectors such as oil and gas, residential wood combustion, cement kilns, livestock, aircraft, CMVs and locomotives. Efforts were made to include some regional haze and state-reported local controls as part of a larger effort to include more local control information on stationary non-EGU sources.

¹⁶ <https://www.epa.gov/air-emissions-modeling/2011-version-63-platform>.

Table 2 and Table 3 illustrate by sector (fire, nonpoint, nonroad, onroad and point), the projected changes in NO_x and VOC emissions in the Knoxville Area between 2014 and 2028. Note, these emissions are for entire counties, while the 1997 8-hour ozone “Orphan” maintenance area only includes a very small part of Cock County and the northern portion of Anderson County. Based on data contained in Table 2, total emissions of NO_x are expected to decline approximately 38% between 2014 and 2028. Similarly, Table 3 indicates that total VOC emissions will decline approximately 40% over the same time. These projected decreases in emissions will ensure that the Knoxville Area will continue maintenance of the 1997 8-Hour ozone NAAQS.

Table 2. Knoxville Area Oxides of Nitrogen Emissions in 2014 and 2028.

	Fire		Nonpoint		Nonroad		Onroad		Point		Total	
	2014	2028	2014	2028	2014	2028	2014	2028	2014	2028	2014	2028
County	----- tons/summer day NO _x -----											
Anderson	-	0.00	1.70	4.39	0.81	0.47	5.35	1.29	4.93	6.69	12.79	12.84
Cocke	0.00	0.02	0.39	0.37	0.41	0.28	3.34	1.21	0.09	0.04	4.22	1.91
Jefferson	-	-	0.56	0.62	1.05	0.74	7.97	3.04	0.00	0.08	9.58	4.47
Loudon	-	-	0.64	0.84	0.77	0.49	5.45	2.26	2.31	1.60	9.17	5.18
Sevier	0.09	0.04	0.23	0.31	0.90	0.57	6.05	1.27	0.16	0.12	7.34	2.27
Total:	0.09	0.07	3.52	6.53	3.94	2.55	28.15	9.07	7.49	8.53	43.10	26.68

Table 3. Knoxville Area Volatile Organic Compound Emissions in 2014 and 2028.

	Fire		Nonpoint		Nonroad		Onroad		Point		Total	
	2014	2028	2014	2028	2014	2028	2014	2028	2014	2028	2014	2028
County	----- tons/summer day VOC -----											
Anderson	-	0.00	6.79	5.75	1.85	1.19	3.14	0.70	0.64	0.95	12.42	8.58
Cocke	0.00	0.22	1.67	1.33	2.44	1.45	1.47	0.41	0.31	0.35	5.90	3.53
Jefferson	-	-	2.80	2.23	2.90	1.37	2.57	0.76	0.26	0.16	8.53	4.52
Loudon	-	-	2.03	1.96	1.93	1.09	2.08	0.71	4.55	1.61	10.60	5.37
Sevier	1.43	0.45	2.76	3.11	6.72	4.25	3.31	0.89	0.03	0.02	12.80	8.27
Total:	1.43	0.67	16.05	14.38	15.85	9.34	12.56	3.46	5.79	3.08	50.25	30.26

Conformity Determinations

Transportation and general conformity rules apply in ozone, carbon monoxide, nitrogen dioxide, particles with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM₁₀), and particles with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers (PM_{2.5}) nonattainment and maintenance areas. Generally, maintenance plans developed for these NAAQS establish emissions limits, or “budgets” for transportation conformity by means of a motor vehicle emission budget and implicitly for general conformity where the estimated emissions in the SIP that reflect the federal action being considered becomes the emission budget that must be met.

EPA's 1994 guidance, *Limited Maintenance Plan Option for Nonclassifiable Ozone Nonattainment Areas*¹⁷, establishes that emissions budgets in LMP areas may be treated as non-constraining for the length of the maintenance period because it is unreasonable to expect that such an area will experience so much growth in that period that a violation of the 1997 8-hour ozone NAAQS would result. For general conformity determinations, this means that emission estimates for federal actions, other than those subject to transportation conformity, would no longer need to be compared to the SIP since the LMP would be considered to have satisfied the required budget test. Table 2 and Table 3 indicate the change in emissions between 2014 and 2028, which includes forecasted growth in the region; yet total emissions are expected to decrease over this time period. These emissions projections include forecast growth in population and activity based on historical trends and best professional practice in forecasting growth in each of the sectors for which emissions were developed. Despite anticipated growth in the region, emissions are projected to decline over time.

For transportation conformity determinations, it would be unreasonable to expect the area to experience so much growth in onroad vehicle emissions during the LMP period that a violation of the 1997 8-hour ozone NAAQS would occur. EPA's 2028 modeling platform included growth, from the base year, in both the onroad vehicle population and vehicle miles traveled. Yet, the onroad NO_x emissions are expected to decrease approximately 67%, and the onroad VOC emissions are expected to decrease approximately 72% between 2014 and 2028. As a result, federal actions requiring transportation conformity determinations under the transportation conformity rule are considered to satisfy the budget test without the need for a regional emissions analysis. Therefore, motor vehicle emission budgets are not established in this LMP.

Approval of this LMP does not relieve transportation partners of the other transportation conformity requirements that may be required. Transportation plan revisions and transportation improvement program conformity determinations may need to satisfy other applicable requirements in 40 CFR 93.109(e) of EPA's transportation conformity rule.

Ozone Monitoring Network

To verify the attainment status of the area over the maintenance period, the LMP should contain provisions for continued operation of an EPA-approved air quality monitoring network, in accordance with the 40 CFR Part 58. This is particularly important for areas using LMPs because there is essentially no cap on emissions.

The Tennessee Department of Environment and Conservation (TDEC), Air Pollution Control Division, (APCD) commits to continue monitoring ozone in the Knoxville 1997 8-hour ozone maintenance area. Any monitor shutdowns or relocations will only be made with the approval of

¹⁷ USEPA, *Limited Maintenance Plan Option for Nonclassifiable Ozone Nonattainment Areas*, November 16, 1994, Memorandum from Sally L. Shaver.

the EPA. The current ozone monitors are operated consistent with 40 CFR Part 58; changes will only be made if they are consistent with 40 CFR Part 58.

Control Programs

Tennessee's original petition to EPA for redesignation and associated maintenance plan for the 1997 8-hour ozone NAAQS for the Knoxville Area included a list of measures that Tennessee believes were instrumental in improving air quality in the region. Tennessee believed that air quality improvement was principally due to a host of federal measures. Additionally, a few state measures were included in those measures that are believed to have helped the area reach attainment of the 1997 8-hour ozone NAAQS.

Federal Measures

The federal measures Tennessee believes were critical to reducing emissions throughout the Knoxville region included the NO_x Budget Trading Program and Clean Air Interstate Rule (CAIR). Tennessee and EPA continue to implement the Cross State Air Pollution Rule (CSAPR) for electricity generating units and the NO_x SIP Call for other large stationary boilers, cement kilns and combustion turbines.

EPA adopted the NO_x SIP Call in October 1998 (63 FR 57356) to mitigate the impact of transported NO_x emissions, one of the precursors of ozone. This rule required 22 states, including Tennessee, and the District of Columbia to amend their SIPs to reduce NO_x emissions that contribute to ozone nonattainment in downwind states. EPA developed the NO_x Budget Trading Program to allow states to meet their NO_x SIP Call obligations by participating in a regional NO_x cap-and-trade program covering large electricity generating units (EGUs) and industrial boilers and turbines (non-EGUs) with a rated heat input greater than 250 million British thermal units per hour. The NO_x Budget Trading Program was approved into Tennessee's SIP on January 22, 2004. The NO_x Budget Trading Program was implemented from 2003 to 2008 and replaced with the CAIR ozone season NO_x trading program in 2009.

On May 12, 2005 (70 FR 25162), EPA promulgated CAIR to address transported emissions that would significantly contribute to downwind states' nonattainment or interfere with maintenance of the 1997 ozone and PM_{2.5} NAAQS. CAIR required SIP revisions in 28 states, including Tennessee, to reduce NO_x emissions and established a new cap-and-trade program for ozone season NO_x emissions. EPA subsequently (71 FR 25328) adopted a Federal Implementation Plan (FIP) and an abbreviated SIP option, which allowed states to remain subject to the CAIR FIP generally, but also adopt "abbreviated" SIP provisions that made certain modifications to the trading programs by allocating allowances among covered units, allowing units to opt-in to the trading programs, or expanding applicability of the CAIR NO_x ozone season trading program to the non-EGUs. EPA

approved Tennessee's abbreviated CAIR SIP revision with non-EGU opt-in provisions on August 20, 2007.

EPA discontinued administration of the NO_x Budget Trading Program in 2009 upon the start of the CAIR trading programs. The NO_x SIP Call requirements continued to apply, however, and EGUs that formerly participated in the NO_x Budget Trading Program, in almost all states continued to meet their NO_x SIP Call requirements under the generally more stringent requirements of the CAIR ozone season trading program. States needed to assess their NO_x SIP Call requirements and take other regulatory action as necessary to ensure that their obligations for the large non-EGUs continued to be met either through submission of a CAIR SIP or other NO_x regulation.

On December 23, 2008, the United States Court of Appeals for the District of Columbia Circuit (D.C. Circuit) remanded CAIR to EPA to develop a new interstate transport rule consistent with the Court's opinion in *North Carolina v. EPA*. EPA issued the Cross-State Air Pollution Rule (CSAPR) in July 2011 to replace CAIR and address the requirements of the good neighbor provision for the 1997 Annual PM_{2.5} NAAQS, the 2006 24-hour PM_{2.5} NAAQS, and the 1997 8-hour Ozone NAAQS. As amended (including the 2016 CSAPR Update, which addressed good neighbor requirements for the 2008 8-hour ozone NAAQS), CSAPR requires 27 states, including Tennessee, to limit their statewide NO_x emissions to mitigate transported air pollution impacting other states' ability to attain or maintain the NAAQS. CSAPR establishes five federal emissions trading programs, including two geographically separate programs for ozone-season NO_x emissions. The CSAPR trading programs are applicable to large EGUs in each covered state, and a state may also expand trading program applicability to include smaller EGUs or, starting in 2017, to non-EGUs. Large EGUs in Tennessee are subject to one of the CSAPR ozone season NO_x trading programs, but Tennessee has not chosen to expand CSAPR applicability to small EGUs (i.e., EGUs serving a generator smaller than 25 megawatts) or non-EGUs.

On February 27, 2017, Tennessee submitted a SIP revision to incorporate a new provision in the Tennessee Air Pollution Control Regulations: 1200-03-27-.12 (NO_x SIP Call Requirements for Stationary Boilers and Combustion Turbines). This rule establishes a state control program for sources that are subject to the NO_x SIP Call but not covered under CSAPR, including basic definitions and applicability provisions; allowance allocation provisions; and provisions for monitoring, reporting, and enforcement. Tennessee's 2017 NO_x SIP Call rule applies to non-EGU boilers and combustion turbines with a maximum design heat input greater than 250 MMBtu/hr that combust fossil fuel in specified amounts, except units that are covered under CSAPR or serve generators producing power for sale, and does not provide for emissions trading. EPA conditionally approved the SIP revision on March 6, 2019, contingent upon Tennessee submitting a complete SIP revision by December 31, 2019 to amend the rule's applicability provisions. Tennessee began implementation of rule 1200-03-27-.12 during the 2017 ozone season and is working on a SIP revision to convert EPA's conditional approval into a full approval.

Additionally, EPA's past and ongoing implementation of various federal mobile source controls, like those on automobiles and fuels, have contributed, and continue to contribute, to improving ozone air quality in the region, and nationally.

State Measures

At the state level, Tennessee, in its original petition for redesignation and maintenance, attributed several state measures to improvements in ozone air quality. Tennessee mentioned these state measures: stage 1 vapor recovery and a statewide vehicle tampering rule in our original petition for redesignation and maintenance.

The stage 1 gasoline vapor recovery rule has been implemented, and as per the rule, those controls remain in effect today. Effective in 2005, the state's Motor Vehicle Tampering rule in Chapter 1200-03-36 continues to apply statewide. Both of these measures are included in Tennessee's federally enforceable SIP.

Tennessee will continue to implement the federal measures discussed earlier as required by EPA and the CAA. Additionally, in keeping with CAA Section 175A(d) Tennessee will continue to implement Tennessee's rules regarding stage 1 vapor recovery and vehicle tampering as contained in Tennessee's SIP in the limited maintenance plan area unless or until the SIP is amended in compliance with the CAA.

Contingency Plan

The contingency plan provisions of the CAA are designed to result in prompt correction or prevention of NAAQS violations that might occur after redesignation of an area to attainment of the NAAQS. The two main elements of the contingency plan are triggering mechanisms to determine when contingency measures are needed and a process of developing and adopting appropriate control measures. The primary trigger of the contingency plan will be a quality assured/quality controlled violating DV of the 1997 8-hour ozone NAAQS at any monitor within the maintenance area. Upon activation of the trigger, the State of Tennessee will commence an analysis to determine what additional measures will be necessary to attain or maintain the 8-hour ozone NAAQS. Since transport from outside the region often impacts local ozone monitors, an evaluation to determine the amount of local emission contribution to the high ozone days may be conducted.

A trigger level response will consist of a study to determine whether the ozone value indicates a trend toward higher ozone concentrations or whether emissions appear to be increasing unexpectedly. The study will evaluate whether the trend, if any, is likely to continue and, if so, the control measures necessary to reverse the trend - taking into consideration ease and timing for implementation, as well as economic and social considerations.

Tennessee will implement the appropriate contingency measures needed to assure future attainment of the 1997 8-hour ozone NAAQS. If determined necessary, the adoption of rules for ensuring attainment and maintenance of the 1997 8-hour ozone NAAQS will begin. Contingency measures will be adopted and implemented as expeditiously as possible, but no later than eighteen to twenty-four months after the triggering event¹⁸. The proposed schedule for these actions would be as follows:

- Six months to identify appropriate contingency measures, including identification of emission sources and appropriate control technologies;
- Three to six months to initiate a stakeholder process; and,
- Nine to twelve months to implement the contingency measures. This step would include the time required to draft rules or SIP amendments, complete the rulemaking process, and submit the final plan to EPA.

If it is determined that a longer schedule is required to implement specific contingency measures, then, upon selection of the appropriate measures, Tennessee will notify EPA of the proposed schedule and will provide sufficient information to EPA to demonstrate that the proposed measures are a prompt correction of the triggering event. The selection of emission control measures will be based on cost-effectiveness, emission reduction potential, economic and social considerations, or other factors that the state deems to be appropriate. Selected emission control measures will be subject to public review, and the state will seek public input prior to selecting new emission control measures.

The measures that will be considered for adoption upon a trigger of the contingency plan may include the following:

- Implementation of diesel retrofit programs, including incentives for performing retrofits
- Reasonably Available Control Technology (RACT) for NO_x sources in counties with violating ozone monitors
- Programs or incentives to decrease motor vehicle use, including employer-based programs, additional park and ride services, enhanced transit service and encouragement of flexible work hours and telecommuting
- Additional emissions reductions on stationary sources
- Enhanced stationary source inspection to ensure that emissions control equipment is functioning properly
- Voluntary fuel programs, including incentives for alternative fuels

¹⁸ If QA/QC data indicates a violating design value for the 8-hour ozone NAAQS, then the triggering event will be the date of the design value violation, and not the final QA/QC date. However, if initial monitoring data indicates a possible design value violation but later QA/QC indicates that a NAAQS violation did not occur, then a triggering event will not have occurred, and contingency measures will not need to be implemented.

- Construction of high-occupancy vehicle (HOV) lanes, or restriction of certain roads or lanes for high-occupancy vehicles
- Programs for new construction of bicycle and pedestrian facilities, including shared use paths, sidewalks and bicycle lanes
- Expand Air Quality Action Day activities or Clean Air Partners public education and outreach
- Additional enforcement or outreach on driver observance of speed limits
- Promote non-motorized transportation
- Promote energy saving plans for local government
- Seasonal open burning ban in nonattainment counties
- Additional controls in upwind areas, if necessary

Other control measures, not included in the above list, will be considered if new control programs are deemed more advantageous for this area.

Potential Additional Improvements to Air Quality

On February 14, 2019, the Tennessee Valley Authority (TVA) Board voted to approve the retirement of Paradise Unit 3 in Kentucky and the Bull Run facility in Anderson County, Tennessee¹⁹. As this is merely a vote to action, these actions are not guaranteed. If the Bull Run facility is retired by 2024, as desired by the TVA Board, this would result in potentially significant reductions of NO_x in the Knoxville area. If these actions are taken, this will further ensure the area will continue to remain in attainment throughout the term of this maintenance plan.

On November 29, 2016, CEMEX, Inc., CEMEX Construction Materials Atlantic, LLC, and CEMEX Construction Materials South, LLC (collectively CEMEX) entered into a consent decree with EPA and the Knox County Department of Air Quality Management to resolve allegations of Prevention of Significant Deterioration and other violations at two Portland cement plants. The consent decree affects five CEMEX Portland cement plants, including a Portland cement plant located in Knox County, Tennessee. The consent decree includes the following NO_x reduction requirements for kiln 1 at the Portland cement plant located in Knox County, Tennessee:

- Limit the 30-day rolling average NO_x emissions to 2.3 lb/hr, and
- Continuously operate a Selective Non-Catalytic Reduction system

¹⁹ <https://www.tva.gov/Newsroom/Press-Releases/TVA-Board-Acts-to-Ensure-Future-Flexibility-Efficient-Generation-System>.

While this facility is outside of the maintenance area, these limits will affect future NO_x emissions from the CEMEX facility in Knox County, which may still have some regional NO_x reduction benefit.

In 2015, Volkswagen (VW) publicly admitted that it had secretly and deliberately installed defeat-device software designed to cheat emissions tests and deceive federal and state regulators in approximately 590,000 model year 2009 to 2016 motor vehicles containing 2.0 and 3.0 liter diesel engines. The United States Department of Justice (DOJ) filed a complaint against VW, alleging that the company had violated the CAA. In October 2016 and May 2017, the U.S. District Court, Northern District of California (“Court”), approved two partial settlements related to the affected 2.0 and 3.0 liter vehicles, respectively, totaling \$14.9 billion (“the VW Settlement”). The VW Settlement will be implemented through the First Partial Consent Decree and Second Partial Consent Decree. Under these consent decrees, VW has agreed to: (1) dedicate \$10 Billion to the recall of at least 85% of the affected 2.0 and 3.0 liter vehicles; (2) invest \$2 Billion in zero-emission vehicle infrastructure and promotion (“Zero Emission Vehicle Investment Plan”); and (3) establish a \$2.9 Billion Environmental Mitigation Trust (EMT) to mitigate the environmental effects of the excess NO_x emissions from the affected vehicles.

The purpose of the EMT is to execute environmental mitigation projects that reduce emissions of NO_x. In accordance with the EMT goal, the State of Tennessee’s overall goal in administering its EMT allocation is to reduce NO_x emissions by targeting the largest contributors of mobile source NO_x emissions in Tennessee: the onroad, diesel heavy duty sector (33% of mobile NO_x emissions) and the onroad, non-diesel light duty sector (40% of mobile source NO_x emissions). As NO_x emissions contribute to the formation of ozone, reductions in NO_x emissions will assist in the state’s efforts to maintain compliance with the NAAQS for ozone.

The State of Tennessee released the final Beneficiary Mitigation Plan (BMP) on September 21, 2018, for implementing the state’s initial allocation from the VW EMT. Project solicitations have already begun, and once implemented NO_x reductions will be realized. It is noted that these emissions reductions may not be especially large, yet they will be wide-spread throughout the onroad vehicle fleet. There will be NO_x emissions benefits throughout the region as the BMPs for Tennessee and other states are implemented.

Conclusion

This document demonstrates that the Knoxville 1997 8-hour ozone “Orphan” Area continues, and is expected to continue, to maintain compliance with the 1997 8-hour ozone NAAQS. Ozone air quality data shows the area not only meets the 1997 ozone NAAQS, but also meets the two subsequent, and more restrictive ozone NAAQS: the 2008 and 2015 ozone NAAQS. Emissions inventory data and emissions modeling projections conducted by EPA show emissions of NO_x and

VOC are expected to continue to decrease essentially throughout the maintenance period. Further, in the unlikely event the area should experience a DV violation of the 1997 8-hour ozone NAAQS, a contingency plan is described in this document to help expeditiously evaluate and address the violation of the 1997 8-hour ozone NAAQS.

Appendix A: Comments and Responses

Comments and Responses

EPA comments received July 3, 2019:

	Commenter	Comment	Response
1.	US EPA	Please refer to page 4 of the 2018 resource document for the 1997 Ozone NAAQS and to CAA Section 175A(d) language, which established the commitment to implement all measures with respect to the control of pollutants for the area. EPA is available for further discussions if needed.	The following paragraph is added to the end of the Control Programs section: Tennessee will continue to implement the federal measures discussed earlier as required by EPA and the CAA. Additionally, in keeping with CAA Section 175A(d) Tennessee will continue to implement Tennessee's rules regarding stage 1 vapor recovery and vehicle tampering as contained in Tennessee's SIP in the limited maintenance plan area unless or until the SIP is amended in compliance with the CAA.
2.	US EPA	EPA suggest including information regarding the growth rate for the Knox County area when discussing General and Transportation Conformity.	<p>The following is appended to the second paragraph in the Conformity Determinations section: Table 2 and Table 3 indicate the change in emissions between 2014 and 2028, which includes forecasted growth in the region; yet total emissions are expected to decrease over this time period. These emissions projections include forecast growth in population and activity based on historical trends and best professional practice in forecasting growth in each of the sectors for which emissions were developed. Despite anticipated growth in the region, emissions are projected to decline over time.</p> <p>The following is added to the third paragraph in the Conformity Determination section: EPA's 2028 modeling platform included growth, from the base year, in both the onroad vehicle population and vehicle miles traveled. Yet, the onroad NOx emissions are expected to decrease approximately 67%, and the onroad VOC emissions are expected to decrease approximately 72% between 2014 and 2028.</p>

EPA comments received November 7, 2019:

	Commenter	Comment	Response
1.	US EPA	Contingency Plan (p. 16) - The EPA recommends removing the last two sentences of the third paragraph and the phrase "if additional controls are necessary" from the fourth paragraph, and replacing "would" with "will" in the third sentence of the fourth paragraph.	Suggested changes incorporated.
2.	US EPA	Page 3 (2nd paragraph) - There is a typo here. The paragraph says 175(b) where it should say 175A(b).	Thank you for pointing this out. The text has been changed.

APCD comments:

	Commenter	Comment	Response
1.	APCD	Inconsistent use of acronyms.	Use of acronyms changed throughout the document.
2.	APCD	Various minor grammatical corrections.	Minor grammatical, text and other changes incorporated throughout the document.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

NOV 06 2019

Michelle Walker Owenby, Director
Division of Air Pollution Control
Tennessee Department of
Environment and Conservation
Tennessee Tower, 15th Floor
312 Rosa L. Parks Avenue
Nashville, Tennessee 37243-1102

Dear Ms. Owenby:

The Region 4 Office of the U.S. Environmental Protection Agency received the Tennessee Department of Environment and Conservation, Division of Air Pollution Control's (TDEC) October 4, 2019, prehearing proposal regarding the Limited Maintenance Plan for the Knoxville 1997 8-hour Ozone orphan maintenance area. The prehearing proposal addresses Tennessee's obligations under the Clean Air Act's Section 175A(b), in response to the court decision *South Coast Air Quality Management District v. Environmental Protection Agency*. We also understand that these changes are subject to a public hearing that will take place on Monday, November 18, 2019. We have completed our review and offer our comments in the enclosure.

We look forward to continuing to work with you and your staff. If you have any questions, please contact Ms. Jane Spann, Acting Chief of the Air Regulatory Management Section at (404) 562-9029, or have your staff contact Mr. Andres Febres at (404) 562-8966.

Sincerely,

Lynorae Benjamin
Acting Chief
Air Planning and Implementation Branch

Enclosure

cc: Brian Rivera, Director,
Department of Air Pollution Control
Knox County Health Department

Marc Corrigan
Division of Air Pollution Control, TDEC

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**The U.S. Environmental Protection Agency's Comments on
Knox County, Tennessee's Prehearing Submission Regarding the 1997 Ozone
National Ambient Air Quality Standard (NAAQS) Limited Maintenance Plan**

General Comments

1. **Contingency Plan (p. 16)** – The EPA recommends removing the last two sentences of the third paragraph and the phrase “if additional controls are necessary” from the fourth paragraph, and replacing “would” with “will” in the third sentence of the fourth paragraph.

Other Comments

2. **Page 3 (2nd paragraph)** – There is a typo here. The paragraph says 175(b) where it should say 175A(b).

**The U.S. Environmental Protection Agency's (EPA) Draft Comments on
Tennessee's Limited Maintenance Plan for the Knox County 1997 8-hour Ozone
NAAQS "Orphan" Maintenance Area (version 2)**

Key Comment

1. Please refer to page 4 of the 2018 resource document for the 1997 Ozone NAAQS and to CAA Section 175A(d) language, which established the commitment to implement all measures with respect to the control of pollutants for the area. EPA is available for further discussions if needed.

General Comment

2. EPA suggest including information regarding the growth rate for the Knox County area when discussing General and Transportation Conformity.

Appendix B: Public Notice and Hearing

NOTICE OF HEARING

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF AIR POLLUTION CONTROL
WILLIAM R. SNODGRASS TENNESSEE TOWER
312 ROSA L. PARKS AVENUE, 15TH FLOOR
NASHVILLE, TENNESSEE 37243
PHONE: (615) 532-0554 FAX: (615) 532-0614

NOTICE IS HEREBY GIVEN, the Division of Air Pollution Control will hold a public hearing pursuant to Tennessee Code Annotated, Section 68-201-105:

Date: Monday, November 18, 2019
Information Session: 2:00 - 2:30 PM Eastern
Public Hearing: 2:30 - 3:30 PM Eastern
Location: Knoxville Environmental Field Office
3711 Middlebrook Pike
Knoxville, Tennessee
Large Main Conference Room

There will be a public hearing before the Technical Secretary of the Tennessee Air Pollution Control Board to consider a proposed change to the State Implementation Plan (SIP) under the authority of Tennessee Code Annotated, Section 68-201-105.

The Clean Air Act (CAA) requires the State of Tennessee to develop an attainment plan for all areas that are not meeting certain National Ambient Air Quality Standards, or NAAQS. These areas are commonly referred to as nonattainment areas. Attainment plans include steps to achieve and maintain attainment of those standards. After air quality in a nonattainment area has improved enough to consistently meet the NAAQS, the area is then referred to as a maintenance area. Maintenance plans must demonstrate continued attainment and maintenance of the NAAQS. These maintenance plans are divided into two sequential phases, with a new plan developed for each ten-year period.

This hearing is to consider the Limited Maintenance Plan (LMP) providing Tennessee's maintenance plan for the remainder of the 20-year maintenance period for the 1997-8 hour ozone NAAQS in the remaining Knoxville 1997 8-hour ozone area. This plan sets forth air quality and emissions data that assures the area will continue to maintain the 1997 8-hour ozone NAAQS. Further, in the unlikely event the area does violate the 1997 8-hour ozone NAAQS, this document describes a plan to promptly address the NAAQS violation. The final version of this document will be submitted to the EPA to meet Tennessee's CAA section 175A(b) obligations for this area.

The hearing will be conducted as prescribed by the Uniform Administrative Procedures Act, Tennessee Code Annotated, Section 4-5-201 et. seq. and will take place at the date, time and location indicated above.

All persons interested will be allowed to present testimony to the hearing officer regarding the proposed revision to the SIP. Anyone desiring to make oral comments at this public hearing should prepare a written copy of their comments to submit to the hearing officer at the hearing. The hearing officer may limit the length of oral comments in order to allow all parties an opportunity to speak, and will require that all comments be relevant to the proposed LMP. Written statements not presented at the hearing will only be considered part of the record if received by close of business (4:30 PM Central) on November 18, 2019, at office of the Division of Air Pollution Control at the address provided above.

Individuals with disabilities who wish to participate in the hearing (or review the file record) should contact TDEC to discuss any auxiliary aids or services needed to facilitate participation. Contact may be in person, by writing, telephone, or other means, and should be made no less than ten working days prior to

November 18, 2019, to allow time to provide such aid or services. Contact the ADA Coordinator (615-532-0207) for further information. Hearing impaired callers may use the Tennessee Relay Service (800-848-0298).

If it is hard for you to read, speak, or understand English, TDEC may be able to provide translation or interpretation services free of charge. Please contact Saul Castillo at (615) 532-0462 for more information.

If you have any questions about the proposed LMP, you may contact Marc Corrigan by phone at (615) 532-0616 or by email at marc.corrigan@tn.gov. Materials concerning the proposed action are available at <https://www.tn.gov/environment/ppo-public-participation/ppo-public-participation/ppo-air.html>.

The above public notice was published on the TDEC Air Pollution Control Public Participation Opportunities website on October 7, 2019. The website address is:

<https://www.tn.gov/environment/ppo-public-participation/ppo-public-participation/ppo-air.html>.

A public hearing was held on November 18th, 2019 at the Knoxville Environmental Field Office. Two individuals, from outside of TDEC, attended the hearing. There were no comments provided at the hearing.

Appendix C: Interagency Consultation

**Knoxville Area
Air Quality Interagency Consultation Group**

3:00 p.m. EDT, Wednesday, June 19, 2019

CALL-IN Number: 1-352-888-6355

Access Code: 144653704#

Screen Share Link: <https://meet.google.com/cha-kxki-rhd>

AGENDA

1. Roll Call
2. Discussion of July 2019 TIP Amendment & Short Conformity Report
3. Discussion of Conformity Process, Draft Project List and Timeline for FY 2020-2023 Transportation Improvement Program (TIP)
4. Discussion of the 1997 8-Hour Ozone Limited Maintenance Plan for the Knoxville Area (TDEC)
5. Other Business/Next Steps

Knoxville Air Quality Interagency Consultation Conference Call
Meeting Minutes for 6/19/19

1.) Roll Call

Call Participants:

Knoxville TPO:

Mike Conger
Craig Luebke

Lakeway MTPO:

Rich DesGrosseillers

EPA:

Kelly Sheckler
Richard Montieth

FHWA:

Sean Santalla

FTA:

None

National Park Service:

None

Tennessee Department of Transportation:

Deborah Fleming

Tennessee Department of Environment & Conservation:

Marc Corrigan
Greg Riggs

Knox County Air Quality Management:

None

Discussion Items:

2.) Discussion of July 2019 TIP Amendment & Short Conformity Report

Mike Conger provided an overview of the draft short conformity report (SCR) for a proposed TIP amendment that was submitted to the IAC on May 22nd. Mike described the contents of the report that indicate satisfaction of the requirements in 40 CFR 93.122 (g) for reliance on a previous regional emissions analysis to demonstrate conformity for this non-exempt project. He noted that the IAC review deadline was this coming Friday, June 21st and any comments or questions could also be addressed on

IAC minutes

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this call. Sean Santalla asked about clarification on whether this project scope had been changed from when it had been previously proposed as a STIP amendment last year. Mike replied that the first time it was submitted that it had listed an incorrect scope as it had apparently been mixed up with another interchange project on the same roadway. Mike further elaborated that this description was now correct and matched what was modeled for conformity.

Mike asked a question of the group for any guidance related to whether the TPO needed to address the 1997 Ozone Standard in this SCR as related to the South Coast vs. EPA court decision affecting that Standard. There was initial discussion among the group that perhaps a statement would need to be included in the SCR to address this aspect, but it was unclear since the particular project in question is within Knox County which is also subject to the 2008 Ozone Standard so it may not be needed. It was confirmed following the call in consultation between FHWA TN Division and Region 4 EPA staff that according to EPA guidance since the affected project is within the 2008 area and conformity is continuing to be demonstrated for the 2008 area, the TPO does not need to determine conformity for the 1997 orphan area.

3.) Discussion of Conformity Process, Draft Project List and Timeline for FY 2020- 2023 Transportation Improvement Program (TIP)

Mike discussed the upcoming need and process for a conformity determination for the next major update of the TPO's Transportation Improvement Program (TIP) that will cover fiscal years 2020-2023. He noted that the key element of the TIP is the project list since the whole purpose of the TIP is to show which projects are receiving funding over the next few years for one of its major phases of work (Engineering, Right-of-Way and Construction). The TIP must be a direct subset of the current Long Range Transportation Plan and this project list is being used to demonstrate that the proposed projects are directly included or are consistent with one of the goals. Mike noted that the majority of projects in the new TIP are simply being carried forward from the current TIP as they are still under development. He stated that there were some new projects being added and these are noted in a separate section of the project list and additional information about these projects will be provided later. He noted that the IAC group should review the list for any immediate questions or comments, but that there will be additional review time for the entire TIP and associated conformity determination. Mike further elaborated that based on the TPO staff analysis of the project list that we feel that conformity can be demonstrated by relying on the most recent regional emissions analysis for the last Long Range Plan amendments since all projects are still consistent with that conformity determination. Mike stated that the projected schedule for IAC review of the draft TIP and conformity determination would be in late July following an initial review by TDOT staff.

There was discussion among the group regarding the same issue from the last item in terms of how to address conformity for the 1997 Ozone Standard. Sean Santalla asked if LAMTPO had prepared a draft project list for the Jefferson County portion. Rich DesGrossellers responded that his project list was complete and he had already provided it to Mike. It was decided that further discussion should occur among TPO, FHWA and EPA regarding the appropriate mechanism to address this.

4.) Discussion of the 1997 8-Hour Ozone Limited Maintenance Plan for the Knoxville Area (TDEC)

Marc Corrigan provided an overview of the document. This document provides Tennessee's maintenance plan for the remainder of the 20-year maintenance period for the 1997-8 hour ozone NAAQS as per Clean Air Act section 175A(b). To provide a bit of context, the Environmental Protection Agency (EPA) revoked the 1997 8-hour ozone National Ambient Air Quality Standards (NAAQS) effective April 5, 2015. EPA's 2008 8-hour ozone "Implementation Plan Requirements" rule provided that states were no longer responsible, under certain conditions, for developing and submitting maintenance plans for former 1997 ozone NAAQS nonattainment areas. Certain aspects of EPA's Implementation Plan rule were challenged in court. One of the items challenged was the Agency's rule that excused "orphan maintenance areas," i.e., areas that had been redesignated to attainment for the 1997 ozone NAAQS and were initially designated attainment for the 2008 ozone NAAQS, from submitting a second maintenance plan for the 1997 ozone NAAQS.

On February 16, 2018, the D.C. Circuit Court issued a decision in *South Coast Air Quality Management District v. EPA* (South Coast II) that, among other things, granted the petitioners argument on this point. The Court held that "orphan maintenance areas" are required to submit the "second 10-year" maintenance plans under Clean Air Act (CAA) section 175A(b). These areas, therefore, must submit a second maintenance plan to ensure maintenance through the full 20-year period following the effective date of redesignation.

To assist areas, EPA provided a resource document that outlines Limited Maintenance Plans (LMP) as an option. Additionally, EPA has published several guidance documents describing "limited maintenance plans". The key criteria outlined in these documents allowing the use of the LMP option is that the current air quality levels for ambient monitoring sites in the area are substantially below the level of the standard. EPA provided guidance that "substantially" is interpreted as below 85% of the level of the standard, or in this case a design value of 71 ppb or less.

To provide some historical background, EPA designated the area as nonattainment for the 1997 8-hour ozone NAAQS, effective June 15, 2004. EPA designated the Knoxville Nonattainment Area to include a number of counties, which were pointed out later in discussion in Figure 2. Based on the design value for ozone data from 2007-2009, the Knoxville area met the 1997 ozone NAAQS, and has been attaining the 1997 ozone NAAQS since. In fact, at this time, all of the Knoxville area is in attainment for each of the various ozone NAAQS, including the most recent, and most restrictive NAAQS: the 2015 8-hour ozone NAAQS set at a level of 70 ppb.

Marc then discussed the basic elements of the LMP. The first, and key element of the LMP, is air quality. Marc pointed out the air quality data and trends depicted in Table 1 and Figure 1. Marc then directed the IAC to Figure 2. This figure illustrates the extent of the LMP area, shown in light green.

Although EPA's guidance notes that emissions inventories are not required for LMPs, since EPA made available emission inventories in their recent resource document, they are included here as further evidence that it is expected that the Area will continue to maintain the '97 ozone NAAQS. Those inventories are shown in Tables 2 and 3. As per EPA's Transportation Conformity Guidance for the South Coast II Court Decision, the LMP explains that MVEBs will not be established. Although Marc noted that this may not relieve transportation officials from other conformity requirements contained in 40 CFR 93.109(e) of EPA's transportation conformity rule.

Marc mentioned that an additional requirement of LMPs is to continue to monitor ozone in the region. This LMP assures that monitoring will continue as needed. Marc also mentioned that the LMP goes into some brief discussion of both federal and state control measures that are thought to contribute to the area attaining and continuing to maintain the '97 ozone NAAQS.

Another component of the LMP is the contingency plan. Contingency plans assure that if air quality should degrade, prompt action will be taken to bring the area back into compliance for the NAAQS. The maintenance plan must identify the contingency measures to be considered for possible adoption, a schedule for adoption and implementation of the selected contingency measures, and a time limit for action by the state. Marc pointed out the schedule and a list of measure that would likely be looked at, although the list is not all inclusive and other measures may be considered as appropriate, begins on the bottom of page 16.

Marc concluded by reiterating the purpose of the document: this document demonstrates that the Knoxville 1997 8-hour ozone "Orphan" Area continues, and is expected to continue, to maintain compliance with the 1997 8-hour ozone NAAQS. Mike echoed one of the points the document mentions: if TVA retires the Bull Run fossil plant as the TVA Board is considering, it may mean additional significant NOx reductions in the region.

5.) Other Business/Next Steps

Sean Santalla asked about next steps regarding the review of the Limited Maintenance Plan in terms of whether FHWA had a subsequent review role. Marc responded that as a participant on the IAC that the FHWA was able to review and provide comments during this IAC review period. He mentioned other steps involved in the final approval process such as subsequent review by EPA and adoption by the State Air Board.

Mike noted that as previously mentioned a draft TIP and conformity determination would be sent to the IAC group sometime in late July and that another conference call would likely be scheduled along with that.

Appendix D: Air Pollution Control Board Order

STATE OF TENNESSEE
AIR POLLUTION CONTROL BOARD

IN THE MATTER OF:)

)
KNOXVILLE AREA LIMITED MAINTENANCE)
PLAN FOR THE 1997 8-HOUR OZONE)
NATIONAL AMBIENT AIR QUALITY)
STANDARD)

ORDER NO. 20-001

BOARD ORDER

EPA designated the Knoxville area nonattainment for the 1997 8-hour ozone NAAQS effective June 15, 2004. The originally designated area included Anderson, Blount, Jefferson, Knox, Loudon and Sevier Counties in their entirety, as well as the portion of Cocke County that falls within the boundaries of the Great Smoky Mountains National Park. EPA approved the first 10-year redesignation request and maintenance plan effective March 8, 2011. Subsequent to this, in a rulemaking for the 2008 8-hour ozone NAAQS, EPA no longer required certain areas to submit second 10-year maintenance plans for certain areas. Certain aspects of this rule, EPA's Implementation Plan rule, were challenged in court. One of the items challenged was EPA's rule that excused "orphan maintenance areas," i.e., areas that had been redesignated to attainment for the 1997 ozone NAAQS and were initially designated attainment for the 2008 ozone NAAQS, from submitting a second maintenance plan for the 1997 ozone NAAQS.

Because the Court overturned this aspect EPA's Implementation Plan rule, this document provides the Limited Maintenance Plan (LMP) for the remainder of the 20-year maintenance period for the 1997-8 hour ozone NAAQS in the remaining Knoxville 1997 8-hour ozone area. This plan sets forth air quality and emissions data that demonstrates the area will continue to maintain the 1997 8-hour ozone NAAQS. Further, in the unlikely event the area does violate the 1997 8-hour ozone NAAQS, this document describes a plan to promptly address the NAAQS violation. This document, once approved, will be submitted to the EPA to meet Tennessee's CAA section 175A(b) obligations for this area.

Approved on January 8, 2020, by the members of the Tennessee Air Pollution Control Board as follows:

